

114TH CONGRESS  
1ST SESSION

# H. R. 1561

To improve the National Oceanic and Atmospheric Administration's weather research through a focused program of investment on affordable and attainable advances in observational, computing, and modeling capabilities to support substantial improvement in weather forecasting and prediction of high impact weather events, to expand commercial opportunities for the provision of weather data, and for other purposes.

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## IN THE HOUSE OF REPRESENTATIVES

MARCH 24, 2015

Mr. LUCAS (for himself, Ms. BONAMICI, Mr. BRIDENSTINE, Mr. SMITH of Texas, Ms. EDDIE BERNICE JOHNSON of Texas, Mr. STEWART, and Mr. ROHRABACHER) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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## A BILL

To improve the National Oceanic and Atmospheric Administration's weather research through a focused program of investment on affordable and attainable advances in observational, computing, and modeling capabilities to support substantial improvement in weather forecasting and prediction of high impact weather events, to expand commercial opportunities for the provision of weather data, and for other purposes.

1       *Be it enacted by the Senate and House of Representa-*  
2       *tives of the United States of America in Congress assembled,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Weather Research and  
3 Forecasting Innovation Act of 2015”.

4 **SEC. 2. PUBLIC SAFETY PRIORITY.**

5 In accordance with NOAA’s critical mission to pro-  
6 vide science, service, and stewardship, the Under Sec-  
7 retary shall prioritize weather research, across all weather  
8 programs, to improve weather data, forecasts, and warn-  
9 ings for the protection of life and property and the en-  
10 hancement of the national economy.

11 **SEC. 3. WEATHER RESEARCH AND FORECASTING INNOVA-  
12 TION.**

13 (a) PROGRAM.—The Assistant Administrator for  
14 OAR shall conduct a program to develop improved under-  
15 standing of and forecast capabilities for atmospheric  
16 events and their impacts, placing priority on developing  
17 more accurate, timely, and effective warnings and fore-  
18 casts of high impact weather events that endanger life and  
19 property.

20 (b) PROGRAM ELEMENTS.—The program described  
21 in subsection (a) shall focus on the following activities:

22 (1) Improving the fundamental understanding  
23 of weather consistent with section 2, including the  
24 boundary layer and other atmospheric processes af-  
25 fecting high impact weather events.

(A) advanced radar, radar networking technologies, and other ground-based technologies, including those emphasizing rapid, fine-scale sensing of the boundary layer and lower troposphere, and the use of innovative, dual-polarization, phased array technologies;

16 (B) aerial weather observing systems;  
17 (C) high performance computing and infor-  
18 mation technology and wireless communication  
19 networks;

20 (D) advanced numerical weather prediction  
21 systems and forecasting tools and techniques  
22 that improve the forecasting of timing, track,  
23 intensity, and severity of high impact weather,  
24 including through—

(ii) more effective use of existing, and  
the development of new, regional and na-  
tional cloud-resolving models;

(iii) enhanced global weather models;

7 and

(iv) integrated assessment models;

(E) quantitative assessment tools for measuring the impact and value of data and observing systems, including OSSEs (as described in section 8), OSEs, and AOAs;

(F) atmospheric chemistry and interactions  
essential to accurately characterizing atmospheric composition and predicting meteorological processes, including cloud microphysical, precipitation, and atmospheric electrification processes, to more effectively understand their role in severe weather; and

(G) additional sources of weather data and information, including commercial observing systems.

23 (4) A technology transfer initiative, carried out  
24 jointly and in coordination with the Assistant Ad-  
25 ministrator for NWS, and in cooperation with the

1 American weather industry and academic partners,  
2 to ensure continuous development and transition of  
3 the latest scientific and technological advances into  
4 NWS operations and to establish a process to sunset  
5 outdated and expensive operational methods and  
6 tools to enable cost-effective transfer of new methods  
7 and tools into operations.

8 (c) EXTRAMURAL RESEARCH.—

9 (1) IN GENERAL.—In carrying out the program  
10 under this section, the Assistant Administrator for  
11 OAR shall collaborate with and support the non-  
12 Federal weather research community, which includes  
13 institutions of higher education, private entities, and  
14 nongovernmental organizations, by making funds  
15 available through competitive grants, contracts, and  
16 cooperative agreements.

17 (2) SENSE OF CONGRESS.—It is the sense of  
18 Congress that not less than 30 percent of the funds  
19 for weather research and development at OAR  
20 should be made available for the purpose described  
21 in paragraph (1).

22 (d) REPORT.—The Under Secretary shall transmit to  
23 Congress annually, concurrently with NOAA's budget re-  
24 quest, a description of current and planned activities  
25 under this section.

## 1 SEC. 4. TORNADO WARNING IMPROVEMENT AND EXTEN- 2 SION PROGRAM.

3       (a) IN GENERAL.—The Under Secretary, in collabora-  
4 ration with the American weather industry and academic  
5 partners, shall establish a tornado warning improvement  
6 and extension program.

(b) GOAL.—The goal of such program shall be to reduce the loss of life and economic losses from tornadoes through the development and extension of accurate, effective, and timely tornado forecasts, predictions, and warnings, including the prediction of tornadoes beyond one hour in advance.

13       (c) PROGRAM PLAN.—Not later than 6 months after  
14 the date of enactment of this Act, the Assistant Adminis-  
15 trator for OAR, in coordination with the Assistant Admin-  
16 istrator for NWS, shall develop a program plan that de-  
17 tails the specific research, development, and technology  
18 transfer activities, as well as corresponding resources and  
19 timelines, necessary to achieve the program goal.

20       (d) BUDGET FOR PLAN.—Following completion of  
21 the plan, the Assistant Administrator for OAR, in coordi-  
22 nation with the Assistant Administrator for NWS, shall  
23 transmit annually to Congress a proposed budget cor-  
24 responding to the activities identified in the plan.

## 1 SEC. 5. HURRICANE WARNING IMPROVEMENT PROGRAM.

2       (a) IN GENERAL.—The Under Secretary, in collabora-  
3 ration with the American weather industry and academic  
4 partners, shall establish a hurricane warning improvement  
5 program.

6       (b) GOAL.—The goal of such program shall be to de-  
7 velop and extend accurate hurricane forecasts and warn-  
8 ings in order to reduce loss of life, injury, and damage  
9 to the economy.

10       (c) PROGRAM PLAN.—Not later than 6 months after  
11 the date of enactment of this Act, the Assistant Adminis-  
12 trator for OAR, in consultation with the Assistant Admin-  
13 istrator for NWS, shall develop a program plan that de-  
14 tails the specific research, development, and technology  
15 transfer activities, as well as corresponding resources and  
16 timelines, necessary to achieve the program goal.

17       (d) BUDGET FOR PLAN.—Following completion of  
18 the plan, the Assistant Administrator for OAR, in con-  
19 sultation with the Assistant Administrator for NWS, shall  
20 transmit annually to Congress a proposed budget cor-  
21 responding to the activities identified in the plan.

22 SEC. 6. WEATHER RESEARCH AND DEVELOPMENT PLAN-  
23 NING.

24 Not later than 6 months after the date of enactment  
25 of this Act, and annually thereafter, the Assistant Admin-  
26 istrator for OAR, in coordination with the Assistant Ad-

1 ministrators for NWS and NESDIS, shall issue a research  
2 and development and research to operations plan to re-  
3 store and maintain United States leadership in numerical  
4 weather prediction and forecasting that—

5                 (1) describes the forecasting skill and tech-  
6 nology goals, objectives, and progress of NOAA in  
7 carrying out the program conducted under section 3;

8                 (2) identifies and prioritizes specific research  
9 and development activities, and performance metrics,  
10 weighted to meet the operational weather mission of  
11 NWS to achieve a weather-ready Nation;

12                 (3) describes how the program will collaborate  
13 with stakeholders, including the American weather  
14 industry and academic partners; and

15                 (4) identifies, through consultation with the Na-  
16 tional Science Foundation, American weather indus-  
17 try, and academic partners, research necessary to  
18 enhance the integration of social science knowledge  
19 into weather forecast and warning processes, includ-  
20 ing to improve the communication of threat informa-  
21 tion necessary to enable improved severe weather  
22 planning and decisionmaking on the part of individ-  
23 uals and communities.

24 **SEC. 7. OBSERVING SYSTEM PLANNING.**

25                 The Under Secretary shall—

- 1                         (1) develop and maintain a prioritized list of  
2                         observation data requirements necessary to ensure  
3                         weather forecasting capabilities to protect life and  
4                         property to the maximum extent practicable;
- 5                         (2) undertake, using OSSEs, OSEs, AOAs, and  
6                         other appropriate assessment tools, ongoing system-  
7                         atic evaluations of the combination of observing sys-  
8                         tems, data, and information needed to meet the re-  
9                         quirements listed under paragraph (1), assessing  
10                         various options to maximize observational capabili-  
11                         ties and their cost-effectiveness;
- 12                         (3) identify current and potential future data  
13                         gaps in observing capabilities related to the require-  
14                         ments listed under paragraph (1); and
- 15                         (4) determine a range of options to address  
16                         gaps identified under paragraph (3).

17 **SEC. 8. OBSERVING SYSTEM SIMULATION EXPERIMENTS.**

- 18                         (a) IN GENERAL.—In support of the requirements of  
19                         section 7, the Assistant Administrator for OAR shall un-  
20                         dertake OSSEs to quantitatively assess the relative value  
21                         and benefits of observing capabilities and systems. Tech-  
22                         nical and scientific OSSE evaluations—
  - 23                                 (1) may include assessments of the impact of  
24                                 observing capabilities on—
    - 25   (A) global weather prediction;

(B) hurricane track and intensity forecasting;

(C) tornado warning lead times and accuracy;

(D) prediction of mid-latitude severe local storm outbreaks; and

10                         (2) shall be conducted in cooperation with other  
11 appropriate entities within NOAA, other Federal  
12 agencies, the American weather industry, and aca-  
13 demic partners to ensure the technical and scientific  
14 merit of OSSE results.

15 (b) REQUIREMENTS.—OSSEs shall quantitatively—

16                   (1) determine the potential impact of proposed  
17 space-based, suborbital, and in situ observing sys-  
18 tems on analyses and forecasts, including potential  
19 impacts on extreme weather events across all parts  
20 of the Nation;

21 (2) evaluate and compare observing system de-  
22 sign options; and

(3) assess the relative capabilities and costs of various observing systems and combinations of ob-

1 serving systems in providing data necessary to pro-  
2 tect life and property.

3 (c) IMPLEMENTATION.—OSSEs—

4 (1) shall be conducted prior to the acquisition  
5 of major Government-owned or Government-leased  
6 operational observing systems, including polar-orbit-  
7 ing and geostationary satellite systems, with a  
8 lifecycle cost of more than \$500,000,000; and

9 (2) shall be conducted prior to the purchase of  
10 any major new commercially provided data with a  
11 lifecycle cost of more than \$500,000,000.

12 (d) PRIORITY OSSEs.—

13 (1) GLOBAL NAVIGATION SATELLITE SYSTEM  
14 RADIO OCCULTATION.—Not later than December 31,  
15 2015, the Assistant Administrator for OAR shall  
16 complete an OSSE to assess the value of data from  
17 Global Navigation Satellite System Radio Occulta-  
18 tion.

19 (2) GEOSTATIONARY HYPERSPECTRAL SOUND-  
20 ER GLOBAL CONSTELLATION.—Not later than De-  
21 cember 31, 2016, the Assistant Administrator for  
22 OAR shall complete an OSSE to assess the value of  
23 data from a geostationary hyperspectral sounder  
24 global constellation.

1       (e) RESULTS.—Upon completion of all OSSEs, re-  
2 sults shall be publicly released and accompanied by an as-  
3 sessment of related private and public sector weather data  
4 sourcing options, including their availability, affordability,  
5 and cost effectiveness. Such assessments shall be devel-  
6 oped in accordance with section 50503 of title 51, United  
7 States Code.

8 **SEC. 9. COMPUTING RESOURCES PRIORITIZATION REPORT.**

9       Not later than 12 months after the date of enactment  
10 of this Act, and annually thereafter, the NOAA Chief In-  
11 formation Officer, in coordination with the Assistant Ad-  
12 ministrator for OAR and the Assistant Administrator for  
13 NWS, shall produce and make publicly available a report  
14 that explains how NOAA intends to—

15              (1) continually support upgrades to pursue the  
16 fastest, most powerful, and cost effective high per-  
17 formance computing technologies in support of its  
18 weather prediction mission;

19              (2) ensure a balance between the research to  
20 operations requirements to develop the next genera-  
21 tion of regional and global models as well as highly  
22 reliable operational models;

23              (3) take advantage of advanced development  
24 concepts to, as appropriate, make next generation  
25 weather prediction models available in beta-test

1 mode to operational forecasters, the American  
2 weather industry, and partners in academic and gov-  
3 ernment research; and

4 (4) use existing computing resources to improve  
5 advanced research and operational weather pre-  
6 diction.

7 **SEC. 10. COMMERCIAL WEATHER DATA.**

8 (a) AMENDMENT.—Section 60161 of title 51, United  
9 States Code, is amended by adding at the end the fol-  
10 lowing: “This prohibition shall not extend to—

11 “(1) the purchase of weather data through con-  
12 tracts with commercial providers; or

13 “(2) the placement of weather satellite instru-  
14 ments on cohosted government or private payloads.”.

15 (b) STRATEGY.—

16 (1) IN GENERAL.—Not later than 6 months  
17 after the date of enactment of this Act, the Sec-  
18 retary of Commerce, in consultation with the Under  
19 Secretary, shall transmit to the Committee on  
20 Science, Space, and Technology of the House of  
21 Representatives and the Committee on Commerce,  
22 Science, and Transportation of the Senate a strategy  
23 to enable the procurement of quality commercial  
24 weather data. The strategy shall assess the range of  
25 commercial opportunities, including public-private

1       partnerships, for obtaining surface-based, aviation-  
2       based, and space-based weather observations. The  
3       strategy shall include the expected cost effectiveness  
4       of these opportunities as well as provide a plan for  
5       procuring data, including an expected implementa-  
6       tion timeline, from these nongovernmental sources,  
7       as appropriate.

8                 (2) REQUIREMENTS.—The strategy shall in-  
9       clude—

10                     (A) an analysis of financial or other bene-  
11       fits to, and risks associated with, acquiring  
12       commercial weather data or services, including  
13       through multiyear acquisition approaches;

14                     (B) an identification of methods to address  
15       planning, programming, budgeting, and execu-  
16       tion challenges to such approaches, including—

17                             (i) how standards will be set to ensure  
18       that data is reliable and effective;

19                             (ii) how data may be acquired through  
20       commercial experimental or innovative  
21       techniques and then evaluated for integra-  
22       tion into operational use;

23                             (iii) how to guarantee public access to  
24       all forecast-critical data to ensure that the  
25       American weather industry and the public

1           continue to have access to information crit-  
2           ical to their work; and

3                         (iv) in accordance with section 50503  
4                         of title 51, United States Code, methods to  
5                         address potential termination liability or  
6                         cancellation costs associated with weather  
7                         data or service contracts; and

8                         (C) an identification of any changes needed  
9                         in the requirements development and approval  
10                        processes of the Department of Commerce to  
11                        facilitate effective and efficient implementation  
12                        of such strategy.

13                         (3) AUTHORITY FOR AGREEMENTS.—The As-  
14                         sistant Administrator for NESDIS may enter into  
15                         multiyear agreements necessary to carry out the  
16                         strategy developed under this subsection.

17                         (c) PILOT PROGRAM.—

18                         (1) CRITERIA.—Not later than December 31,  
19                         2015, NOAA shall publish data standards and speci-  
20                         fications for space-based commercial weather data.

21                         (2) PILOT CONTRACT.—

22                         (A) CONTRACT.—Not later than October  
23                         1, 2016, NOAA shall, through an open competi-  
24                         tion, enter into at least one pilot contract with  
25                         a private sector entity capable of providing data

1           that meet the standards and specifications set  
2           by NOAA to provide commercial weather data  
3           in a manner that allows NOAA to calibrate and  
4           evaluate the data.

5                 (B) ASSESSMENT OF DATA VIABILITY.—  
6           Not later than October 1, 2019, NOAA shall  
7           transmit to Congress the results of a deter-  
8           mination of the extent to which data provided  
9           under the contract entered into under subpara-  
10          graph (A) meet the criteria published under  
11          paragraph (1).

12                 (3) OBTAINING FUTURE DATA.—NOAA shall,  
13          to the extent feasible, obtain commercial weather  
14          data from private sector providers.

15                 (4) AUTHORIZATION OF APPROPRIATIONS.—  
16          There are authorized to be appropriated out of funds  
17          made available for procurement, acquisition, and  
18          construction at NESDIS, \$9,000,000 for carrying  
19          out this subsection.

20 **SEC. 11. ENVIRONMENTAL INFORMATION SERVICES WORK-**  
21 **ING GROUP.**

22                 (a) ESTABLISHMENT.—The NOAA Science Advisory  
23          Board shall continue to maintain a standing working  
24          group named the Environmental Information Services

1 Working Group (in this section referred to as the “Work-  
2 ing Group”) to—

3                   (1) provide advice for prioritizing weather re-  
4 search initiatives at NOAA to produce real improve-  
5 ment in weather forecasting;

6                   (2) provide advice on existing or emerging tech-  
7 nologies or techniques that can be found in private  
8 industry or the research community that could be in-  
9 corporated into forecasting at NWS to improve fore-  
10 casting skill;

11                  (3) identify opportunities to improve commu-  
12 nications between weather forecasters, emergency  
13 management personnel, and the public; and to im-  
14 prove communications and partnerships among  
15 NOAA and the private and academic sectors; and

16                  (4) address such other matters as the Science  
17 Advisory Board requests of the Working Group.

18 (b) COMPOSITION.—

19                  (1) IN GENERAL.—The Working Group shall be  
20 composed of leading experts and innovators from all  
21 relevant fields of science and engineering including  
22 atmospheric chemistry, atmospheric physics, meteor-  
23 ology, hydrology, social science, risk communica-  
24 tions, electrical engineering, and computer sciences.

1       In carrying out this section, the Working Group may  
2       organize into subpanels.

3               (2) NUMBER.—The Working Group shall be  
4       composed of no fewer than 15 members. Nominees  
5       for the Working Group may be forwarded by the  
6       Working Group for approval by the Science Advisory  
7       Board. Members of the Working Group may choose  
8       a chair (or co-chairs) from among their number with  
9       approval by the Science Advisory Board.

10          (c) ANNUAL REPORT.—The Working Group shall  
11       transmit annually to the Science Advisory Board for sub-  
12       mission to the Under Secretary a report on progress made  
13       by NOAA in adopting the Working Group's recommenda-  
14       tions. The Science Advisory Board shall transmit this re-  
15       port to the Under Secretary. Within 30 days of receipt  
16       of such report, the Under Secretary shall transmit it to  
17       the Committee on Science, Space, and Technology of the  
18       House of Representatives and the Committee on Com-  
19       merce, Science, and Transportation of the Senate.

20 **SEC. 12. INTERAGENCY WEATHER RESEARCH AND INNOVA-  
21                      TION COORDINATION.**

22          (a) ESTABLISHMENT.—The Director of the Office of  
23       Science and Technology Policy shall establish an Inter-  
24       agency Committee for Advancing Weather Services to im-  
25       prove coordination of relevant weather research and fore-

1 cast innovation activities across the Federal Government.

2 The Interagency Committee shall—

3                 (1) include participation by the National Aero-  
4                 nautics and Space Administration, the Federal Avia-  
5                 tion Administration, NOAA and its constituent ele-  
6                 ments, the National Science Foundation, and such  
7                 other agencies involved in weather forecasting re-  
8                 search as the President determines are appropriate;

9                 (2) identify and prioritize top forecast needs  
10                 and coordinate those needs against budget requests  
11                 and program initiatives across participating offices  
12                 and agencies; and

13                 (3) share information regarding operational  
14                 needs and forecasting improvements across relevant  
15                 agencies.

16                 (b) Co-CHAIR.—The Federal Coordinator for Meteor-  
17                 ology shall serve as a co-chair of this panel.

18                 (c) FURTHER COORDINATION.—The Director shall  
19                 take such other steps as are necessary to coordinate the  
20                 activities of the Federal Government with those of the  
21                 American weather industry, State governments, emer-  
22                 gency managers, and academic researchers.

23 **SEC. 13. OAR AND NWS EXCHANGE PROGRAM.**

24                 (a) IN GENERAL.—The Assistant Administrator for  
25                 OAR and the Assistant Administrator for NWS may es-

1 establish a program to detail OAR personnel to the NWS  
2 and NWS personnel to OAR.

3 (b) GOAL.—The goal of this program is to enhance  
4 forecasting innovation through regular, direct interaction  
5 between OAR's world-class scientists and NWS's oper-  
6 ational staff.

7 (c) ELEMENTS.—The program shall allow up to 10  
8 OAR staff and NWS staff to spend up to 1 year on detail.  
9 Candidates shall be jointly selected by the Assistant Ad-  
10 ministrator for OAR and the Assistant Administrator for  
11 NWS.

12 (d) REPORT.—The Under Secretary shall report an-  
13 nually to the Committee on Science, Space, and Tech-  
14 nology of the House of Representatives and to the Com-  
15 mittee on Commerce, Science, and Transportation of the  
16 Senate on participation in such program and shall high-  
17 light any innovations that come from this interaction.

18 **SEC. 14. VISITING FELLOWS AT NWS.**

19 (a) IN GENERAL.—The Assistant Administrator for  
20 NWS may establish a program to host postdoctoral fellows  
21 and academic researchers at any of the National Centers  
22 for Environmental Prediction.

23 (b) GOAL.—This program shall be designed to pro-  
24 vide direct interaction between forecasters and talented  
25 academic and private sector researchers in an effort to

1 bring innovation to forecasting tools and techniques avail-  
2 able to the NWS.

3 (c) SELECTION AND APPOINTMENT.—Such fellows  
4 shall be competitively selected and appointed for a term  
5 not to exceed 1 year.

6 **SEC. 15. NOAA WEATHER RADIO ALL HAZARDS “MARK**

7 **TRAIL” AWARD PROGRAM.**

8 (a) PROGRAM.—The Assistant Administrator for  
9 NWS is authorized to establish the NOAA Weather Radio  
10 All Hazards “Mark Trail” Award Program. This award  
11 program shall provide annual awards to honor individuals  
12 or organizations that use or provide NOAA Weather Radio  
13 All Hazards receivers or transmitters to save lives and  
14 protect property. Individuals or organizations that utilize  
15 other early warning tools or applications also qualify for  
16 this award.

17 (b) GOAL.—This award program draws attention to  
18 the life-saving work of the NOAA Weather Radio All Haz-  
19 ards program, as well as emerging tools and applications,  
20 that provide real-time warning to individuals and commu-  
21 nities of severe weather or other hazardous conditions.

22 (c) PROGRAM ELEMENTS.—

23 (1) NOMINATIONS.—Nominations for this  
24 award shall be made annually by the Weather Field  
25 Offices to the Assistant Administrator for NWS.

1 Broadcast meteorologists, weather radio manufacturers  
2 and weather warning tool and application developers,  
3 emergency managers and public safety officials  
4 may nominate individuals and/or organizations  
5 to their local Weather Field Offices, but the final list  
6 of award nominees must come from the Weather  
7 Field Offices.

8 (2) SELECTION OF AWARDEES.—Annually, the  
9 Assistant Administrator for NWS shall choose winners  
10 of this award whose timely actions, based on  
11 NOAA weather radio all hazards receivers or trans-  
12 mitters or other early warning tools and applica-  
13 tions, saved lives and/or property or demonstrated  
14 public service in support of weather or all hazard  
15 warnings.

16 (3) AWARD CEREMONY.—The Assistant Admin-  
17 istrator for NWS shall establish a means of making  
18 these awards to provide maximum public awareness  
19 of the important Weather Radio All Hazards pro-  
20 gram, and such other warning tools and applications  
21 as are represented in the awards.

22 **SEC. 16. DEFINITIONS.**

23 In this Act:

24 (1) AOA.—The term “AOA” means an Anal-  
25 ysis of Alternatives.

1                         (2) NESDIS.—The term “NESDIS” means  
2                         the National Environmental Satellite, Data, and In-  
3                         formation Service.

4                         (3) NOAA.—The term “NOAA” means the Na-  
5                         tional Oceanic and Atmospheric Administration.

6                         (4) NWS.—The term “NWS” means the Na-  
7                         tional Weather Service.

8                         (5) OAR.—The term “OAR” means the Office  
9                         of Oceanic and Atmospheric Research.

10                         (6) OSE.—The term “OSE” means an Observ-  
11                         ing System Experiment.

12                         (7) OSSE.—The term “OSSE” means an Ob-  
13                         serving System Simulation Experiment.

14                         (8) UNDER SECRETARY.—The term “Under  
15                         Secretary” means the Under Secretary of Commerce  
16                         for Oceans and Atmosphere.

17 **SEC. 17. AUTHORIZATION OF APPROPRIATIONS.**

18                         (a) FISCAL YEAR 2015.—There are authorized to be  
19                         appropriated for fiscal year 2015—

20                         (1) \$90,800,000 to OAR to carry out this Act,  
21                         of which—

22                         (A) \$70,000,000 is authorized for weather  
23                         laboratories and cooperative institutes; and

24                         (B) \$20,800,000 is authorized for weather  
25                         and air chemistry research programs; and

1                             (2) out of funds made available for research  
2                             and development at NOAA, an additional amount of  
3                             \$16,000,000 for OAR to carry out the joint tech-  
4                             nology transfer initiative described in section  
5                             3(b)(4).

6                             (b) FISCAL YEARS 2016 AND 2017.—For each of fis-  
7                             cal years 2016 and 2017, there are authorized to be ap-  
8                             propriated in OAR—

9                             (1) \$100,000,000 to carry out this Act, of  
10                             which—

11                                 (A) \$80,000,000 is authorized for weather  
12                             laboratories and cooperative institutes; and

13                                 (B) \$20,000,000 is authorized for weather  
14                             and air chemistry research programs; and

15                             (2) an additional amount of \$20,000,000 for  
16                             the joint technology transfer initiative described in  
17                             section 3(b)(4).

18                             (c) LIMITATION.—No additional funds are authorized  
19                             to carry out this Act, and the amendments made by this  
20                             Act.

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